

NOTES ON THE SYNONYMS OF *TROMBICULA MINOR* BERLESE 1904.

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[Read 25th September, 1940.]

Much discussion and explanation can be avoided if the relevant facts are set out in chronological order:

1904. Berlese described *T. minor* (nymph or adult, from an imperfect specimen) from Java.
1912. Berlese described *T. mediocris* (adult), also from Java.
1916. Tanaka described *T. pseudoakamushi* from Japan.
1918. Kitashima and Miyajima reported *Leptus autumnalis* Shaw 1790 from Formosa.
1919. Hatori reported a new species from Formosa which he named "*T. pseudoakamushi*".
1920. Miyajima stated that *T. minor* was the nymph of *T. mediocris* (or vice versa; both versions exist).
1921. Kawamura and Yamaguchi reported *T. pseudoakamushi* Hatori from Formosa, and suggested that it was the larva of *T. mediocris*.
1923. Walch reported *T. pseudoakamushi* Hatori from Sumatra, on man but not on rats.
1924. Walch referred to the Sumatran species as "*T. pseudoakamushi* (variatio *deliensis*)".
1925. Walch referred to the Sumatran species as "*T. pseudoakamushi* (variatio *deliensis* ?)", and stated that its nymph very closely resembled both *T. mediocris* and (with certain differences) the nymph of *T. pseudoakamushi* (Kawamura and Yamaguchi) from Formosa.
1927. Walch reported *T. pseudoakamushi* Hatori on rats from Sumatra and Macassar.
1927. Sambon described *T. hirsti* from Queensland.
1929. Hirst stated that *T. hirsti* was probably identical with *T. pseudoakamushi* Hatori.
1930. Tanaka *et al.* described *T. autumnalis japonica*.
1932. Gater reported a Malayan species identical with both *T. hirsti* and *T. pseudoakamushi* Hatori (after Walch); he called the Malayan species *T. hirsti*. He also emphasized the difference between Walch's species and that of Kawamura and Yamaguchi. In addition, he stated that the species identified by Kitashima and Miyajima as *L. autumnalis* Shaw was definitely distinct from *T. autumnalis japonica*; that it was not *T. autumnalis* Shaw; and that it was actually very close to *T. pseudoakamushi* Hatori from Sumatra.
1939. Gunther described *T. hirsti* var. *buloloensis* (which had acquired a synonym, *T. hirsti* var. *morobensis*, nom. nud.) from New Guinea, and suggested that it was only a local variant, closely allied to *T. pseudoakamushi* Hatori.
1939. Gunther bred nymphs of *T. hirsti* var. *buloloensis*, and established their identity with *T. minor*.
1939. Womersley discounted the importance of the local variations between *T. hirsti* and *T. hirsti* var. *buloloensis*; and identified the nymph of *T. hirsti* with that of *T. hirsti* var. *buloloensis*, and with *T. minor*.

The Australian, New Guinea, Sumatran, and Malayan species need no discussion, and the evidence is sufficient in the case of the species identified as *L. autumnalis* Shaw from Formosa. There is also no doubt that Walch was correct in identifying his species with Hatori's *T. pseudoakamushi*, and therefore Hatori's species is also identical with *T. minor*.

Because Berlese's description of *T. minor* is based on an imperfect specimen, Miyajima's contention that *T. mediocris* is identical with it cannot be directly proved or disproved. There is the collateral evidence of Walch, however, on the close resemblance between the Sumatran nymphs and *T. mediocris*; and of Kawamura and Yamaguchi, who suggested that their species was the larva of *T. mediocris*. Walch and Gater both pointed out slight differences between this larva and that of Walch, while Walch noted minor differences between the nymphs. The host relationships agree, however, and the writer believes that the identification is valid.

In the writer's opinion, the following is therefore the complete list of synonyms.

TROMBICULA MINOR Berlese 1904.

T. mediocris Berlese 1912 (Java); Kawamura and Yamaguchi, 1921 (Formosa).

Non *Leptus autumnalis* Shaw 1790, according to Kitashima and Miyajima, 1918 (Formosa).

T. pseudoakamushi, Hatori 1919 (Formosa), according to Kawamura and Yamaguchi, 1921 (Formosa); according to Walch, 1923 (Sumatra).

T. pseudoakamushi var. *deliensis*, Walch, 1924 (Sumatra).

T. pseudoakamushi (var. *deliensis*?) Walch, 1925 (Sumatra).

T. hirsti Sambon 1927 (Australia), according to Gater, 1932 (Malaya).

T. hirsti var. *morobensis* (nom. nud.), Gunther, 1938.

T. hirsti var. *buloloensis* Gunther 1939 (New Guinea).

References.

- BERLESE, A., 1904.—*Redia*, ii, fasc. 2, 155.
 ———, 1912.—*Redia*, viii, fasc. 1, 93.
 EWING, H. E., 1920.—*Ann. Ent. Soc. Amer.*, xiii, 381.
 GATER, B. A. R., 1932.—*Parasitology*, xxiv, 143.
 GUNTHER, C. E. M., 1938.—*Med. J. Aust.*, ii, No. 6, 202.
 ———, 1939.—*Proc. Linn. Soc. N.S.W.*, lxiv, 78.
 ———, 1939.—*Ibid.*, 466.
 HATORI, J., 1919.—*Ann. Trop. Med. Parasit.*, xiii, 233.
 HIRST, S., 1929.—*Ann. Mag. Nat. Hist.*, (10) iii, 564.
 KAWAMURA, R., and YAMAGUCHI, M., 1921.—*Kitasato Arch. Exp. Med.*, iv, 169.
 KITASHIMA, T., and MIYAJIMA, M., 1918.—*Ibid.*, ii, 237.
 SAMBON, L. W., 1927.—*Ann. Mag. Nat. Hist.*, (9) xx, 157.
 TANAKA, K., 1916.—*Ikai Jiho*, 1164, 1701.
 ———, KAIWA, J., TERAMURA, S., and KAGAYA, J., 1930.—*Zbl. Bakt. Parasit.*, 116, 353.
 WALCH, E. W., 1923.—*Kitasato Arch. Exp. Med.*, v, 63.
 ———, 1924.—*Trans. 5th Bienn. Congr. Far East. Ass. Trop. Med.*, 601.
 ———, 1925.—*Kitasato Arch. Exp. Med.*, vi, 235.
 ———, 1927.—*Geneesk. Tijdschr. Ned.-Ind.*, vi, 67, 922.
 WOMERSLEY, H., 1939.—*Trans. Roy. Soc. S. Aust.*, lxiii, 149.